LIST OF PENDING CLAIMS

1. (Previously Presented) A device for providing a perspective-corrected view of at least a portion of a wide angle image, comprising:

an image-capturing device having a fish-eye lens for generating the wide angle image as a projection of at least a section of a viewing hemisphere associated with the lens onto an image plane,

a processor coupled to the image capturing device that receives the image, the processor further comprising:

a first display module for displaying the wide angle image, and

a second display module for displaying a perspective-corrected view of a portion of the image,

the processor further comprising a correlation module for displaying a graphical object on the displayed wide angle image that identifies the selected portion of the image displayed in the perspective-corrected view,

wherein the processor generates said perspective-corrected view from a vantage point offset relative to a center of said viewing hemisphere.

2. (Previously Presented) The device of claim 1, wherein the processor further comprises a scale adjuster that applies to said perspective-corrected view a user-adjustable magnification.

3. (Original) The device of claim 1, further comprising a user interface module coupled to the processor for selecting a portion of the image to be displayed as a perspective-corrected view.

4. (Original) The device of claim 3, wherein the user interface allows selecting a magnification for viewing the perspective-corrected portion of the image.

5. (Original) The device of claim 1, wherein the wide angle image is a fish-eye image.

6. (Previously Presented) The device of claim 2, wherein the processor generates the

perspective-corrected view of a portion of the image by transforming that portion according to a defined magnification and an angle for viewing a section of the hemisphere corresponding to that image portion from said offset vantage point.

7. (Original) The device of claim 5, wherein the image-capturing device further comprises an imager coupled to the fish-eye lens for converting optical photons collected by the lens from the field of view into electrical signals representing an image of the field of view.

8. (Previously Presented) The device of claim 7, wherein the imager can be any of a CCD array, a CMOS array, or a thermal imaging device.

9. (Original) The device of claim 7, wherein the imager has a resolution in a range of about one million to about 100 million effective pixels per square inch.

10. (Original) The device of claim 5, wherein the processor generates the perspective-corrected view by mapping a point (u,v) on an undistorted image plane corresponding to a perspective-corrected portion of a distorted image to a point (x,y) on a plane corresponding to the distorted image, the mapping is provided by the following equations:

$$x = R\,(\beta_0 / (PI / 2))\cos(d_0)$$

$$y = R\,(\beta_0 / (PI / 2))\sin(d_0)$$

$$t = [D\,d + \mathrm{sqrt}(D^2 d^2 - (u^2 + v^2 + d^2)(D^2 - 1))] / (u^2 + v^2 + d^2)$$

$$\beta_0 = \arctan(-D\cos(\beta) + d\,t\cos(\beta) - v\,t\sin(\beta), 1)$$

$$\delta_0 = \arctan(-D\sin(\beta) + d\,t\sin(\beta) + vt\cos(\beta), u\,t) + \delta$$

where β and δ are the zenith and azimuthal angles corresponding to the center of the undistorted image, β_0 and δ_0 are the zenith and azimuthal angles corresponding to a pixel (u,v) in the undistorted image, d is a magnification factor, D is a level of undistortion, and R is the radius of the fisheye image.

11. (Original) The device of claim 10, wherein each of the distorted and undistorted image planes includes a two-dimensional array of pixels providing a digital luminance map

corresponding to the image or a perspective-corrected portion of the image, respectively.

12. (Original) The device of claim 11, wherein the processor generates the luminance value of a pixel corresponding to the point (u,v) by calculating a weighted average of luminance values of two or more pixels surrounding the point (x,y), if the point (x,y) does not correspond to a pixel on the distorted image plane.

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Canceled)

17.(Original) A device for providing a perspective-corrected view of at least a portion of a wide angle image, comprising:

an image-capturing device having a fish-eye lens for generating the wide angle image,

a processor in communication with the image-capturing device,

the processor correcting at least a portion of the image for distortions introduced by the fish-eye lens by mapping a point (u,v) on an undistorted image plane corresponding to a perspective-corrected view of the image portion to a point (x,y) on a distorted image plane corresponding to the image in accord with an angle for viewing a section of the hemisphere corresponding to the image portion from a vantage point offset from a center of the hemisphere and a distance between the vantage point and the center of the hemisphere.

18. (Original) The device of claim 17, wherein the processor employs the following equations to effect the mapping between the point (u,v) and the point (x,y):

$x = R (\beta_0 / (PI / 2)) \cos(d_0)$

$y = R (\beta_0 / (PI / 2)) \sin(d_0)$

$t = [D\ d + sqrt(D^2\ d^2 - (u^2 + v^2 + d^2)\ (D^2 - 1))] / (u^2 + v^2 + d^2)$

$\beta_0 = \arctan(-D\ \cos(\beta) + d\ t\ \cos(\beta) - v\ t\ \sin(\beta), 1)$

$\delta_0 = \arctan(-D\ \sin(\beta) + d\ t\ \sin(\beta) + vt\ \cos(\beta), u\ t) + \delta$

where β and δ are the zenith and azimuthal angles corresponding to the center of the undistorted image, β_0 and δ_0 are the zenith and azimuthal angles corresponding to a pixel (u,v) in the undistorted image, d is the magnification factor, D is the level of undistortion, and R is the radius of the fisheye image

19.(Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Original) A method for generating a perspective-corrected view of a portion of a fish-eye image, comprising:

mapping a point (u,v) on an undistorted image plane corresponding to a perspective view of the image portion to a point (x,y) on a distorted image plane corresponding to the fish-eye image according to the following equations:

$x = R\ (\beta_0 / (PI / 2))\ \cos(d_0)$

$y = R\ (\beta_0 / (PI / 2))\ \sin(d_0)$

$t = [D\ d + sqrt(D^2\ d^2 - (u^2 + v^2 + d^2)\ (D^2 - 1))] / (u^2 + v^2 + d^2)$

$\beta_0 = \arctan(-D\ \cos(\beta) + d\ t\ \cos(\beta) - v\ t\ \sin(\beta), 1)$

$\delta_0 = \arctan(-D\ \sin(\beta) + d\ t\ \sin(\beta) + vt\ \cos(\beta), u\ t) + \delta$

where β and δ are the zenith and azimuthal angles corresponding to the center of the undistorted image, β_0 and δ_0 are the zenith and azimuthal angles corresponding to a pixel

(u,v) in the undistorted image, d is the magnification factor, D is the level of undistortion, and R is the radius of the fisheye image

25. (Canceled)